Flightfax
ARMY AVIATION RISK-MANAGEMENT INFORMATION
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A Closer Look at FY03 ACCIDENTS

Flightfax

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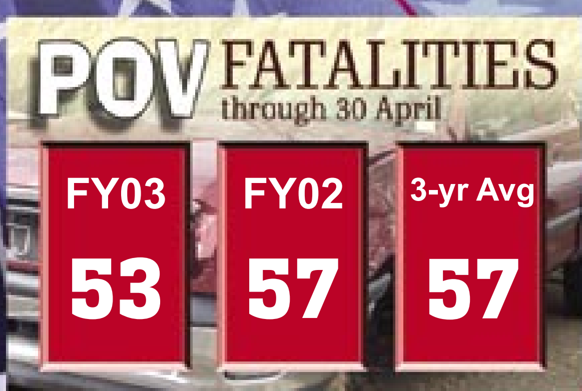

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James E. Simmons
Brigadier General, US Army
Commanding

Keeping Our Guard Up

The majority of the enemy's guns in Iraq are now silent. The scenes from the fall of Saddam Hussein's statue in the center of Baghdad and particularly the dramatic rescues of our brave young men and women once held captive now have been added to the collection of our proudest moments in the history of the United States of America.

Equally as important, the rescues themselves will serve as a comfort to all present and future generations of soldiers and their families. Let no one doubt that for your selfless service and the many sacrifices you make for this great country, this Army, and this Nation, we will not forget you—no one will be left behind—and those who would willfully inflict harm on you will not go unpunished. This is yet another lesson that any present or future enemy of our great Nation should heed.

Staying intensely focused was easy when the mission before us was to liberate the Iraqi people, protect each other, and recover our comrades. Maintaining situational awareness isn't an option when the enemy is firing back or when our fellow soldiers' lives are in peril. A momentary lapse in vigilance could be deadly. But now that the major pockets of resistance have been overcome, the Iraqi people are getting a daily taste of that precious thing called freedom that we, as Americans, have long been willing to defend and even to die for. Sadly, some of our American and coalition soldiers have paid the ultimate price in helping them secure that freedom.

The loss of any life is a tragic event, whether it occurs while engaging the enemy or whether it happens as the result of a moment of carelessness. History shows that we repeatedly lose more soldiers to accidents than to enemy action. We survived the early stages of the war with minimal accidental losses, and I believe that this is a testament to the training of each soldier and commander's emphasis on properly integrating risk management into mission planning, preparation, and execution.

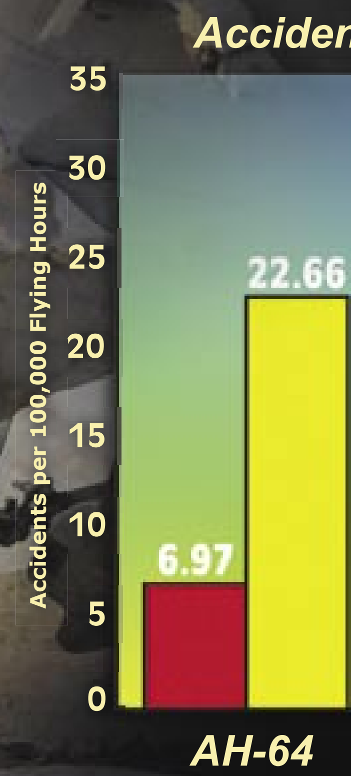
Historical data also tells us that often the most dangerous portion of any mission is when it is almost over and we are starting to feel the symptoms of "get-home-itis." Time and again, the majority of our losses have occurred once the battlefield guns have fallen silent and the flight crews are headed home. That's when the adrenalin slows, our guards drop, hazards are overlooked, and accidents happen.

Your determination, skill, discipline, and execution of each trained task to standard has helped us be overwhelmingly victorious in the early main battles—but the dangers have not yet fully passed. I urge you to maintain vigilance, being ever alert for new hazards as situations and conditions change.

It has been said many times before that "He is safe who is always on guard."

Keep your guard up!

James E. Simmons



A Closer Look at FY03 ACCIDENTS

By: Charisse Lyle

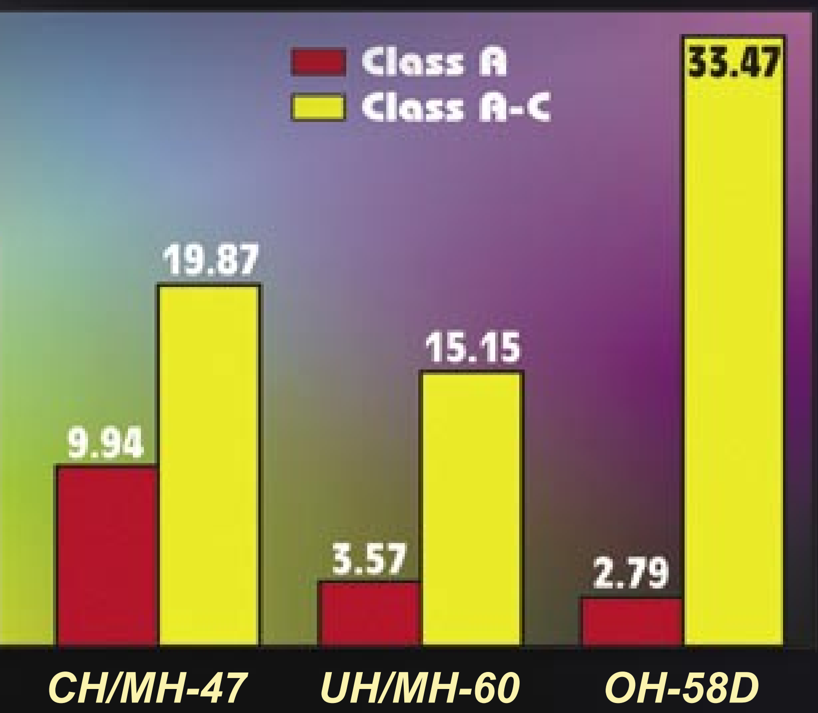
Since 1 October 2002, the Army has experienced 54 Class A through C aviation accidents. These accidents have resulted in 25 fatalities and more than $84 million in damage and injury costs. Almost a third of the accidents (16 out of 54) occurred in Operations Iraqi Freedom and Enduring Freedom. Brownout conditions were a contributing factor in half of these accidents (8 of the 16).

Airframes

The bar chart above compares the accident rates for each of the force modernized aircraft.

■ **UH/MH-60 Black Hawk (17)**. The Black Hawk had the lowest Class A through C rate; however, the majority of accident fatalities occurred in this aircraft. Ninety-six percent (24 of 25) of the fatalities during this timeframe occurred in four Black Hawk accidents. The high number of fatalities was due, in part, to the fact that the Black Hawk had troops onboard in one of the accidents. In that accident alone, there were 11 fatalities. Of the four Class A accidents, low moon illumination, low contrast, and poor terrain definition were common hazardous conditions in two (both in Southwest Asia). Inadvertent instrument meteorological conditions (IMC) were a definite contributing factor in one Class A accident and a suspected factor in the remaining Class A accident. Pilot reports (PIREPs) and planned and rehearsed

t Rates by Aircraft for Mid-Year FY03



emergency instrument recovery procedures are important controls to help mitigate the risk of these deadly accidents.

■ **AH-64 Apache (14)**. The Apache had the second highest Class A and Class A through C accident rate of all the force modernized aircraft. Brownout conditions were contributory in four of the Class A and B accidents. Other events included inadvertent drift while at an out-of-ground-effect (OGE) hover resulting in a tree strike, a wire strike (wires were reportedly unmarked on the map), and a bird strike. In one accident, the main rotor blades contacted the pilot night vision system (PNVS) during an evasive maneuver to evade a training surface-to-air radar. In two Class C accidents, suspected tree-strike blade damage was noted during the post-flight inspection.

■ **OH-58D Kiowa Warrior (KW) (12)**. The KW had the lowest Class A (a whiteout and subsequent tree strike), but highest Class A through C accident rate for this timeframe. Half of the KW Class C accidents involved emergency procedure training {autorotations (2), manual throttle operations (2), and a simulated engine failure (1)}. These resulted in rotor or engine overspeeds or overtorques and/or hard landings. One Class C accident involved inadvertent drift into a tree while at an OGE hover during night battle position operations ("Hellfire" training). Another involved a wire strike during night vision goggle (NVG) terrain flight. In this case, a flight of two KWs conducting NVG multi-ship training descended into a valley for low level flight. The lead aircraft struck a set of three power lines. The crew escaped without injury and there was minor damage to the aircraft.

■ **CH/MH-47 Chinook (7)**. The Chinook had the highest Class A rate. All of these accidents occurred during Operation Enduring Freedom. Five of the seven (71 percent) Class A through C accidents occurred during approach and landings. Two of these involved brownout conditions resulting in hard landings; one involved a wire strike during a precautionary landing; and in another, the three aft rotor blades struck the ground when landing on uneven terrain.

Summary

Environmental conditions were a contributing factor in many of the accidents during the first half of FY03. Brownout conditions, in particular, presented a challenge to flight safety. Crews must use effective crew coordination and be prepared to execute a go-around when the touchdown point is lost. Inadvertent IMC is a deadly hazard that continues to claim needless lives every year. Failure to commit to instruments immediately upon entry into inadvertent IMC conditions is a fatal mistake. Periodic hands-on training for this contingency is critical in preparing aviators to confidently and successfully react to this emergency.

Editor's note: These statistics are current from the USASC database as of 25 April 2003. Delayed reports could change these figures somewhat in the coming months. ♦

—Charisse Lyle, Operations Research and Systems Analysis Division, DSN 558-2091 (334-255-2091), charisse.lyle@safetycenter.army.mil

Written by accident investigators to provide major lessons learned from recent centralized accident investigations.

UH/MH-60 Lessons Learned

By: MAJ Ron Jackson

Midway through FY03, the Black Hawk has experienced an uncharacteristic increase in Class A accidents. As of 31 March, the Army has experienced 12 aviation Class A accidents, of which 4 involved the H-60. These accidents include the UH-60A, UH-60L, and MH-60L. The most disturbing detail is that in these four accidents, we experienced 24 fatalities.

Accident #1

The mission was to conduct night vision goggle (NVG) continuation training and crewchief NVG readiness-level (RL) progression training. The crew conducted preflight with no deficiencies and the crew brief was completed.

The crew departed the airfield and completed a frequency change to the local flight-following facility. When the UH-60 crew failed to provide a position report at the required time, the flight-following agency requested that a sister ship try to establish communication. A UH-60 was successful in contacting the crew and relayed to the flight-following facility that her sister ship had arrived at their destination and would contact them via landline after shutdown.

While waiting for refuel, the PC contacted the flight-following agency and informed them that they were having communication problems on all frequencies. He further relayed their anticipated departure time; however, the crew did not update their weather forecast. The aircraft departed on time and was following an established route structure. As weather began to deteriorate, the crew decided to circumnavigate the worsening weather conditions by turning to the east of the route. Approximately 20 minutes into the flight, the aircraft impacted the crest of a ridgeline. Results: Aircraft destroyed and five fatalities.

Accident #2

The mission was to conduct day direct action penetrator (DAP) familiarization and night multi-ship DAP training. The air mission brief (AMB) was completed, the crew conducted preflight with no deficiencies, and the aircrew brief was completed with emphasis on DAP familiarization and procedures.

It took approximately 50 minutes to complete the DAP familiarization, at which time the aircraft returned to the airfield to re-arm and swap out pilots. The instructor pilot (IP) remained aboard as the crew swapped out. After completing re-arm, Chalk 2 departed to link up with Flight Lead at the range.

The crew linked up with 'Lead' and began the night portion of the training, with the pilot (PI) on the controls. Approximately 30 minutes after arriving, Flight Lead reported they were out of ammunition and were returning to the airfield; Chalk 2 remained on station to complete their training. At this time, the PI transferred the controls to the IP.

The aircraft was cleared left after the IP completed his second engagement. They began a left break to prepare for the next engagement. Seconds after initiating the break, the aircraft impacted the ground with an estimated 54-degree left roll and 22-degree nose-low attitude. Results: Aircraft destroyed and four fatalities.

Accident #3

The mission was to conduct multi-ship day and night exfiltration training of four 6-man long-range surveillance (LRS) teams in preparation for future operations. The company that was assigned the mission usually

conducted command and control operations in support of higher headquarters; but due to the task organization of the aviation task force, the unit was given the mission to conduct the exfils. The crew conducted preflight with no deficiencies and the crew brief was completed.

During taxi to the runway, tower informed the flight that the field was under instrument flight rules (IFR) conditions with visibility 2½ miles and requested their intentions. Flight Lead requested a special visual flight rules (SVFR) departure, which was approved by tower. The flight established staggered left formation and flew toward their first checkpoint. As the flight continued, the weather, coupled with blowing sand, made it difficult to maintain visual reference with the ground. With conditions continuing to worsen, the aviation mission commander (AMC) announced to the personnel on his aircraft that they were returning to base and the mission was cancelled. The crew initiated a climbing left turn only to find themselves in inadvertent instrument meteorological conditions (IIMC).

As Flight Lead continued to climb, one of the crewmembers still maintained visual reference with Chalk 2, which had not followed Flight Lead. Suddenly he observed a bright flash as Chalk 2 impacted the ground at an estimated 165 knots. Results: Aircraft destroyed and four fatalities.

Accident #4

The mission was to conduct day multi-ship infantry battle skills training, loading and unloading, and orientation flight. The crew conducted a preflight after a mandatory 10-hour inspection. There were no deficiencies found on preflight and the crew brief was completed.

After departure from the airfield, Chalk 2 moved to staggered right formation. Once the flight transitioned to low-level flight, the formation changed to free cruise. Shortly thereafter, Chalk 2 noticed Chalk 3 separating from the formation. The PC of Chalk 2 anticipated this due to the training that was being conducted by the IP in Chalk 3. After completing the orientation, the flight began its approach to the airfield. Flight Lead contacted tower and reported a flight of three for landing. However, tower replied "Understand flight of two for landing" and Lead responded, "We are a flight of three." Tower replied, "There are only two aircraft in your formation, cleared to land Bravo Two."

The accident aircraft impacted flat, marshy terrain at an angle of impact of approximately 30 degrees nose-low attitude and an undetermined left bank angle. Results: Aircraft destroyed, 11 fatalities, and 2 serious injuries.

Lessons learned

Preliminary investigations have ruled out mechanical factors in all the accidents, therefore leaving human or environmental factors as causal or contributory. Although these accidents occurred in a variety of locations with a range of crew experience, there are common trends among the causes.

■ **Environmental hazards**. Three of the four accidents occurred during zero percent lunar illumination, whether natural or due to cloud cover, and in areas of low-terrain contrast, making it even more difficult for aircrews to accurately estimate altitudes and closure rates. Two of the four had limited visibility due to precipitation and deteriorating weather; however, investigation indicates that neither crew attempted to transfer to instrument flight.

■ **Inadequate weather dissemination and forecasting support**. In two of the four accidents, inadequate weather observations made it difficult for forecasters to accurately determine weather conditions beyond their local flying area. In the remote areas of operation, it is incumbent on Army aviators to submit accurate pilot reports (PIREPs) so that weather personnel can maintain an accurate picture of changing weather conditions. Without these PIREPs, forecasters cannot effectively produce forecasts, amendments, or advisories.

■ **Lack of proficiency in IIMC recovery procedures**. Every year aviators conduct their annual instrument evaluation; but how often do aviators practice IIMC procedures in the aircraft? Generally this evaluation is conducted via table talk or in a flight simulator. Regardless of how this procedure is trained or evaluated, there is still reluctance for aviators to commit to IIMC.

■ **Leaders fail to enforce standards**. Leaders are failing to enforce standards and integrate risk management into planning, preparation, and execution of missions. These varying degrees range from active leader involvement to minimal leader involvement. Risk management is an ever-evolving process that must be continually assessed from the start to the finish of every mission; it does not end when the mission brief sheet and risk assessment worksheet are signed.

To date, we have lost 24 of the Army's most precious resources in four Class A Black Hawk accidents alone. Our missions are never easy; danger lurks in the environments in which we train. We must work hard to protect our soldiers and learn from our mistakes. ♦

—MAJ Ron Jackson, Aviation Systems and Accident Investigation Division, U.S. Army Safety Center, DSN 558-3754 (334-255-3754), ronald.jackson@safetycenter.army.mil

Aircraft Refueling and Defueling Aboard Navy Ships

By: CW4 Micheal J. Vandeveer, U.S. Army Retired

A wise man once said, "Going to sea is a great deal like going to prison, with a good chance of drowning." I don't believe that he realized the depth of that statement. For the past few years, a dedicated group of professional military men, government employees, and a few civilian contractors at the Joint Shipboard Helicopter Integration Process (JSHIP) office have been struggling with an age-old problem: what happens when Army and Air Force rotary-wing aircraft are required to deploy aboard Navy ships? JSHIP, a joint test and evaluation effort by the Office of the Secretary Defense, was chartered to address that specific issue.

In this article, I would like to address just a single small facet of that challenge: refueling and defueling Army rotary-wing aircraft aboard Navy ships.

General procedures for refueling and defueling operations

Refuel and defuel procedures MUST be closely coordinated with the ship's crew and flight deck control. Firefighting crews, in proper uniform, must man their equipment and be in constant communication with flight deck control. All activities on the flight deck will be coordinated with flight deck control. If at all possible, it is recommended that all refuel and defuel procedures be discussed at length prior to embarkation. In almost every case, the ship's crew is not familiar with Army aircraft, and Army aircrews might not be familiar with refueling and defueling procedures aboard Navy ships.

Jet fuels

Jet fuels constitute the principal problems in aircraft firefighting. The Navy uses the following aircraft jet fuels: JP-4, JP-5, and JP-8. However, aboard Navy ships, only JP-5 will be used. JP-5 has a freeze point temperature of -51ºF, yet does not have anti-ice or anti-static additives other than fuel system icing inhibitor (FSII). If available at a shore facility, it is recommended that aircrews refuel with JP-5 before embarking.

The following has been extracted from Aircraft Refueling NATOPS Manual, NAVAIR 00-80T-109, and NWP 3-04.1:

The ship's refueling personnel are called "Grapes" because of the purple jerseys they wear. Grapes usually conduct all refuel and defuel

operations. Crew chiefs or plane captains, trained and qualified in accordance with NAVAIR 00-80T-109, may also conduct shipboard refueling. Additionally, if the Grapes are unfamiliar with the embarked aircraft, they will need to receive aircraft-specific fueling systems orientation as soon as possible prior to or immediately after embarkation aboard the ship. This orientation brief is recommended to be conducted in conjunction with the required crash, salvage, firefighting, safety, and egress training brief(s).

A minimum of three people are needed for refueling an aircraft aboard ship: refueling crewman, refueling station operator, and a crew chief or plane captain. A crew leader (safety person) also is recommended for each refueling; however, a crew leader may supervise multiple fueling operations simultaneously. Refueling personnel routinely conduct "in-line" fuel sampling at the hose prior to fueling. Consequently, expect minor fuel spills during the sampling process.

Prior to refueling the first aircraft each day, fuel should be flushed through the refueling hose and nozzle and tested for contamination. The fuel from each hose in use will be tested every 24 hours at a minimum. Fueling should not begin until the acceptable results listed below have been obtained:

- Less than 2 milligrams or liters solid contaminants.
- Less than 5 (PPM) free water.
- Over 0.03 percent FSII (for aircraft, including H-60s requiring FSII) to prevent water-ice formation.

Debark all passengers aboard the aircraft to be refueled. The crew chief or plane captain will check for "hot brake" conditions, and grounding and bonding cable(s) from the deck to the aircraft will be attached. Aircraft windows and side doors (if installed) should remain closed during the entire fueling operation—aircraft refueling operations should be stopped if a window or side door is opened.

Crew changes and hot seating should not be conducted during hot refueling. Exceptions: rear cargo doors and/or doors on opposite sides of aircraft from the refueling adapter may be open. However, the refueling hose must be positioned so that in the event of a nozzle or adapter malfunction or hose rupture, fuel will not enter the aircraft passenger, cargo, or cockpit compartment(s).

Personnel in the vicinity of the refueling aircraft will wear full flight deck gear. Standard flight deck personal protective equipment (PPE) includes long sleeves, float coats, goggles, cranials (helmets) with hearing protection, and flight deck steel-toed boots. Refuelers will wear additional protective gear, such as gloves.

Hot refueling

Hot refueling will be performed using only single-point refueling (SPR) or closed-circuit refueling (CCR) nozzles and aircraft receptacles. Aircraft will not be gravity refueled or open-port refueled with the engines operating because of the increased probability of a fuel spill and fire. This policy is contained in NAVAIR 00-80T-109 and applies to Navy and Marine Corps Air Stations and tactical refueling sites, as well as naval ships.

Single-point refueling (SPR)

The Navy uses the NATO Standard D-1 Pressure Refuel Nozzle to both refuel and defuel their aircraft, and it can be used to refuel most joint aircraft; however, the D-1 cannot be used to defuel Army aircraft. Ensure refueling personnel are aware of this limitation.

Closed-circuit refueling (CCR) nozzles

The two types of CCR nozzles usually found aboard ship are the Navy "Wiggins" or "North Island" CCR Nozzle (model AE87549) and the Navy NATO High Capacity (NHC) Nozzle used for helicopter in-flight fueling rules (HIFR) operations. These nozzles can fit onto Army helicopter adapters, but they regulate pressure to 45 pounds per square inch gauge (psig), in contrast to the standard 15 psig Army requirement. All Navy aircraft can be refueled up to 55 psig, while Army aircraft allow a maximum of either 15 psig or 55 psig, depending on model. The UH-60 Black Hawk and AH-64 Apache can be refueled with the 45 psig CCR HIFR nozzle, while the UH-1 Iroquois, AH-1 Cobra, and OH-58 Kiowa can only be pressure-refueled at 15 psig. The Navy's CCR nozzle might overpressure Army UH-1 and OH-58 CCR systems and possibly damage them.

MH-6 aircraft do not have CCR capability. The Army's AE83206R Nozzle (connects to the quick-disconnect [QDC] or QDC adapter) and the AE83501R Nozzle (designed for unisex coupling) deliver a maximum 15 psig and are appropriate for shipboard use. It is recommended that units include one Army CCR nozzle per OH-58 aircraft that embarks or receives fuel from ships on a regular basis.

Procedures (IAW NAVAIR 00-80T-109)

■ The pilot will select fuel loading, ensure that the cockpit switches are in the proper positions, and monitor UHF radio with the primary flight control (PriFly).

■ The pilot will secure (turn to OFF position) all unnecessary electronic and electrical equipment not required for refueling.

■ The pilot will place all armament switches in the SAFE position.

Aircraft auxiliary power units (APU):

The aircraft APU can be used to supply electrical power for pressure refueling on aircraft so equipped on the flight deck. However, refueling with the APU running should not be conducted in hangar bay areas because "hot refueling" is prohibited in all ship hangars.

One person should be located at the APU controls in the cockpit. The pilot or qualified crewmember and the refueling personnel should communicate by hand signals, signal wands, or aircraft internal communications systems (ICSs) to ensure immediate response in the event of an emergency.

Cold refueling

Cold refueling is conducted with closed- or open-port refueling adapters. Open-port or over-the-wing refueling (gravity refueling) is authorized for aircraft that are shut down. When required by operational necessity (combat), the Navy may waive hot open-port refueling and allow shipboard open-port hot refueling of aircraft.

Additionally, the Army may waive its prohibition IAW Field Manual (FM) 10-67-1 under the following conditions:

■ During combat operations, open-port hot refueling may be used for helicopters when, in the judgment of the aviation commander and at the discretion of the captain of the ship, the requirements of the tactical mission and the benefits of reducing ground time outweigh the risks of this method of refueling.

■ During non-combat situations, there must be compelling reasons in order for open-port hot refueling to be allowed.

Gravity refueling

Some Army helicopters have external drop tanks, known as the extended range fuel system (ERFS), which do not have SPR or CCR capability and must be gravity refueled. MH-6 aircraft must also be gravity refueled because they lack CCR systems.

Extended range fuel tanks

Should your unit be required to have extended range fuel tanks of any type, it is HIGHLY RECOMMENDED that they be filled with JP-5 prior to embarking. If this is not possible, it is recommended that these fuel tanks arrive aboard the ship empty so they can be filled with JP-5 aboard the ship. Defueling fuel tanks aboard Navy ships is extremely difficult. ♦

Editor's note: There are many challenges that an embarked unit might face concerning aircraft refueling and defueling aboard Navy ships. For more information, go to the JSHIP Web site at ***http://www.jship.jcs.mil*** *and find an in-depth analysis of fueling and defueling procedures and training, to include compatibility issues for all types of aircraft that were tested by JSHIP.* Due to space, we were unable to publish CW4 Vandeveer's full story. *Check our website for his complete story –* ***http://safety.army.mil***.

—Micheal J. Vandeveer (Retired CW4 Army Aviator), JSHIP Procedures and Training Director, Patuxent River Navy Test Center, MD, DSN 342-4974 x211 (301-342-4974 x211), Vandeveermj@navair.navy.mil

Power Management—What Is It?

By: CW5 Mike Moore

The term "power management" was coined by the High Altitude Army Aviation Training Site (HAATS) to describe its particular training system and techniques. This training system was devised to promote a greater understanding of the forces at work in the operation and application of the helicopter. Failure of pilots to recognize simple relationships between these forces and aircraft instrumentation is at the root of many of Army Aviation's accidents.

The HAATS, through extensive testing over the years, has developed a particular type of training that directly addresses these relationships and forces pilots to come to terms with them consciously and continuously. This type of training formulates a higher awareness of these issues and creates positive habit formation that benefits pilots when they're under severe stress—the kind of stress one expects in high gross weight, high density altitude (DA), and combat operations. It's just these kinds of operations to which Army Aviation routinely deploys.

At the foundation of power management are three tasks simulating max gross weight: the reconnaissance, landing, and takeoff. The term "simulated" is important for three reasons. First, by being able to effectively simulate maximum power, the pilot obtains a reference by which he can objectively gauge performance. Secondly, the simulated reference is used to hold the pilot completely accountable for assessment, planning, and execution throughout the maneuvers. Lastly, since it is only simulation, all the true power available is available in the event of a failure in assessment, planning, or execution. This makes it a truly productive, yet safe, method of training.

In flight, the tasks are presented in a simple training format to aid the pilot in organizing and prioritizing the recon. This format, known as the landing zone sequence (LZS), is a compelling, logical way to assess important information with respect to the pilot's and aircraft's maximum capability in a landing zone (LZ). Its constant use trains the aviator to quickly, efficiently, accurately, and reflexively assess a situation. This need becomes apparent in combat when only seconds might be available to see, assess, plan, and execute.

The LZS has nine steps: (1) identification of the LZ; (2) power assessment; (3) wind drift circle; (4) wind and terrain analysis; (5) routes (in, out, and escape); (6) low recon; (7) target torque; (8) approach and departure; and (9) post-task analysis.

It is worthy of reiteration that the format is designed to train a pilot to assess a situation reflexively and accurately. It is not a combat maneuver where the tactical threat curtails the time available to conduct a lengthy assessment. A brief summary of the issues and training goals is outlined below using the LZS.

(1) Identify the LZ. This step demands the pilot's immediate and instinctive assessment of the overall suitability of the LZ. Can helicopter operations be conducted in this location? In addition, he must decide if more than minimum hover power is required to operate in and around the LZ (in-ground effect (IGE) to out-of-ground effect (OGE)). This assessment will either be confirmed or refuted at step 9.

(2) Power assessment. Using tabular data, the pilot determines the maximum weight he can lift to OGE in the LZ, what the aircraft currently weighs, whether he possesses OGE capability and by how much, actual maximum power available, and the power required to hover IGE for the current weight. The power determined to hover IGE at the current weight will be used as simulated maximum power until step 7. In restricting the power available to the pilot during the recon, he is forced to pay particular attention to all aspects of his flight maneuvers until such time as the approach is executed. Awareness of aerodynamic, power, and environmental issues is heightened throughout the recon through this increased accountability. This provides powerful insights into the requirements involved for precise speed, altitude, and bank angle control, as well as escape routing when low and slow.

(3) and (4) Wind drift circle and wind and terrain analysis. These steps are used to determine horizontal wind flow over the terrain. Useful information anywhere, it's of particular use in mountainous terrain. Knowing the direction and velocity of the wind allows the pilot to use the wind zones and rules of airflow (wind and terrain analysis) taught by the HAATS to accurately predict the wind flow in all three dimensions, but particularly in the areas where he will be low, slow, and vulnerable. Once the direction, velocities, and zones are predicted, they must be proved, either now or in the low recon. This immediate feedback verifies or refutes predictions allowing the pilot immediate feedback on his ability to perform this analysis.

(5) Routes (in and out). Routes in and out and their associated escape routes (of which there can be several for the entire maneuver) generally are self-evident after completing the first four steps. The escape routes must account for all visible and invisible hazards. Invisible hazards are those hazards where the pilot must know that certain conditions, when joined, produce specific results (e.g., high DA, high gross weight, and high closure rates can lead to loss of tail rotor effectiveness (LTE) or rotor droop). Steep approaches of approximately 300 feet per minute rate of descent, low forward speed, 20 to 100 percent of power applied, and near max gross weight produce conditions for settling with power. Strong downdrafts close to the surface or strong turbulence near the touchdown point are also examples of invisible hazards. Pilots must be able to visualize the convergence of these conditions, know their early warning signs, and have a plan designed for these specific occurrences. At some point on all approaches, the aircraft is too close to the ground or obstacles to get away to the safety of altitude. This point must be recognized, and plans to escape to the surface are then implemented. This requirement demands a detailed assessment of the surface conditions. The surface must allow for an escape to the ground.

(6) Low recon. Information gained in steps 1 through 5 provides the basis for a plan for both the approach and departure. The low recon will be used to verify the viability of this plan. It provides the time and opportunity to scrutinize it at close quarters. Escape routes are checked for viability—can I really decrease collective, turn right, lose altitude, and still get away from the terrain from this point? If not, they must be adjusted. Are the winds exactly from the direction predicted, etc.? Is the precise landing point safe for touchdown if an escape to the ground becomes necessary? Are environmental conditions the same as used in tabular data? Army aircrew training manuals (ATMs) call for the low recon to be performed on final approach. However, for pilots training at simulated or real max gross weight with the attendant limited power and options, extra time and attention is required to perform this maneuver correctly. Consequently, under the simulated standards of our tasks, the low recon and approach are executed separately.

During the low recon, special attention is paid to what are known as cockpit indicators. These are aircraft instruments which, when combined with ground cues, provide specific information with respect to wind conditions. Comparing indicated airspeed to groundspeed quickly alerts the pilot to the presence of a head or tail wind. Crab angle (heading compared to ground track) speaks to a crosswind. Instant vertical speed indicators (IVSIs) or vertical speed indicators (VSIs) reveal updrafts and downdrafts. During the approach, these and other indicators will be used to continue to monitor the wind situation and closure rates, both horizontal and vertical.

(7) Target torque. This is a very critical step in the power management process. The training system revolves around four separate and important torque settings. The first, hover torque, was derived in step 2 from tabular data. It serves as a reference during the recon—as simulated maximum power—and forces the pilot to consider how the aircraft is maneuvered in the airspace available so as not to compromise his limited capability. Just as importantly, it provides a reference to construct target torque, the pilot's prediction for the approach, of what power setting will be required to hover in the LZ at a given hover height. The information contained in tabular data reflects the influences of DA and gross weight. The only influences left to consider for hovering are those of wind direction, velocity, and surface issues. Consequently, target torque uses tabular data as a starting point from which to estimate the effects of the wind and surface. In addition, the pilot must predict the target torque for takeoff. This power setting is often different than the prediction for the approach.

(8) Approach and departure. Here the decision is made whether to attempt the maneuver. If attempted, the crew is briefed and the maneuver executed. Cockpit indicators are monitored throughout the approach for the earliest signs of a changing wind situation or that closure speeds, horizontal or vertical, are anything other than what they should be. When a deteriorating situation is detected, a go-around is immediately initiated. If the situation is not detected and is allowed to deteriorate past the point of resolution, the escape is executed. The go-around is defined as a proactive maneuver where full control is still available. An escape is a reactive maneuver where full control is not available and typically the collective must be lowered, airspeed increased, or both. This greatly increases the rate of descent, and this higher loss of altitude must be factored into the escape plan. In both the approach and departure, the non-flying pilot must note the maximum power used and where it was used in relation to the planned touchdown point.

(9) Post-task analysis. This step is conducted upon the completion of the maneuver, either approach or departure. *This is the most important step in the power management training system: it is here that the most learning will occur because the pilot must explain and prove correct any discrepancies that exist between the four torque settings*. The first, hover torque, comes directly from tabular data and is used as a reference to construct the second, target torque. The non-flying pilot captured the third, expended torque, while the fourth, actual torque, is a simple confirmation of the torque actually required to hover at the location and height selected. When compared, however, some interesting results can be discerned. When the target is compared to the actual, target being the prediction of actual based on the perception of wind and surface conditions, the pilot is evaluated on the quality of that perception. Discrepancies direct him back to the quality of the recon and his ability to conduct wind and terrain analysis, a key skill around any obstacles, particularly mountains. Rechecks of the surface—slopes, vegetation, or any obstruction to ground effect—as well as of the winds teach him their qualities, effects, and the actual and precise impact on power and/or controllability. Differences between hover torque, obtained from tabular data, and actual torque can be directly attributed to the effect being examined. This is priceless information, particularly when one is heavy and the demand for precision is high.

Discrepancies noted between expended torque and actual torque reveal the quality of the execution of the maneuver. It is assumed in this training that no more power is required to execute than that required to hover. This is, in fact, true with the notable exceptions of very steep and downwind approaches. In these exceptions, the pilot is required to predict both target torque (the prediction of the power required to hover and actual torque) and expended torque, because expended torque is known to be higher than actual torque. The requirement to predict both allows for complete accountability, both for the approach profile conditions of steep and downwind approaches as well as the LZ itself (where the effects of LZ winds and surface conditions must always be acknowledged). In addition, always having to verify the accuracy of actual torque aids the pilot in determining just how steep an approach must be to consume more than hover power. Returning to the study of discrepancies, failure to execute well is almost always caused by a failure to perceive well—failure to see important visual cues or failure to correctly interpret what is seen. Most pilots rely exclusively on external cues to control the aircraft. In environments where such cues are weak or absent—over water, night, desert, or mountains—pilots are particularly vulnerable to control issues. This vulnerability is dramatically intensified when power is limited in high-DA, high-weight operations. Power management demands the informed use of internal cues known simply as cockpit indicators. Habitual use of these cues dramatically lessens reliance on external ones and provides the basis for accurate dissection of the maneuver and precise, repeatable control.

Post-task analysis is the most important step in the power management training system: it is here that the most learning will occur because the pilot must explain and prove correct any discrepancies that exist between the four torque settings.

The takeoff post-task analysis operates similarly, except there are only three torques with which to compare: hover torque (the torque actually required to hover prior to takeoff), target torque (the prediction of the maximum torque required to execute the maneuver), and expended torque (the amount of power used and captured by the non-flying pilot). Target torque is compared to expended torque only, and within the comparison lies the awareness and understanding of environmental and execution factors similar to the approach, although not as readily categorized.

Upon discerning the suspected reasons for any discrepancies, the pilot must determine how to correct them and what indicators will be used to accomplish the correction, be it in the recon or the execution. The pilot must repeat the maneuver or recon using the techniques prescribed until the power settings match. At this time, it can be stated that he has learned what affects or influences the aircraft, the degree to which it is affected (in terms of percentages of torque), and what indicators are used to control, repeat, or detect the influences. Constant training to this standard lays the required habit foundation for the high, hot, and heavy flight environment where immediate, reflexive action is required—the environment to which Army Aviation so routinely deploys. ♦

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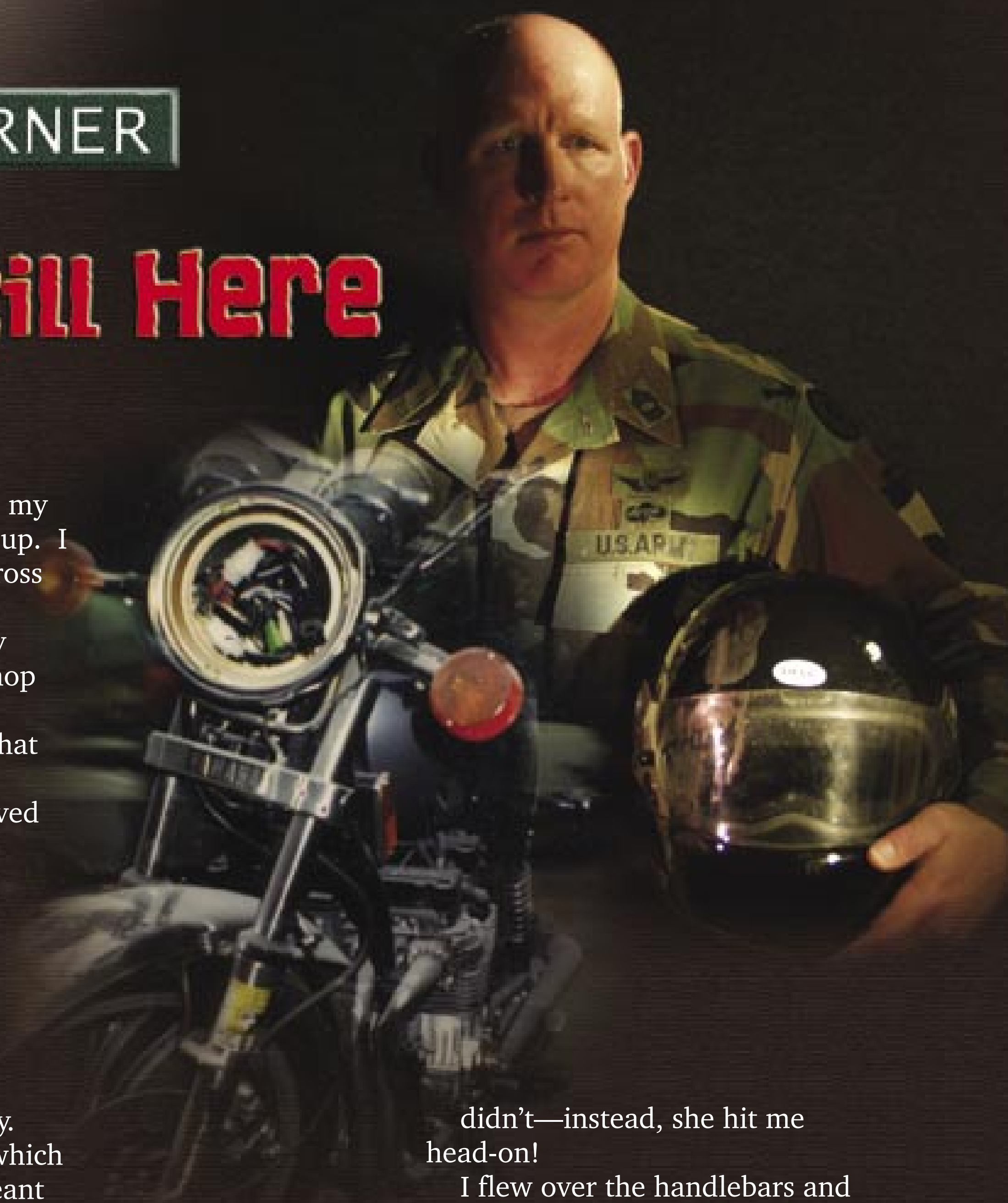
NCO CORNER

I Am Still Here

By: MSG Shane Curtis



Motorcycles were my thing as I grew up. I raced in motocross competitions just about every weekend and worked for the shop that sponsored me. I fell often enough to learn the hard way that my helmet, gloves, elbow and shoulder pads, boots, long-sleeved jersey, and riding pants really did work. But it wasn't until one night after I joined the Army that I learned just how important my helmet was.

I bought a new Yamaha 650 street bike and ordered a full-face helmet that looked cool. That cost me some money. I always needed more money, which meant I needed to get my sergeant stripes. To get that promotion, I needed to go to night school to further my education and gain an airframe and powerplant (A&P) license. Riding my motorcycle was part of that process. When I got off duty, I rode home, grabbed my books, and then headed off to school on my new bike.

But all that would change one night. As I was going down the four-lane road heading towards our house, a teenage girl who'd had her license less than a week came toward me from the opposite direction. She saw me coming her way, but thought the car behind her was going to rear-end her, so she turned in front of me thinking she could make it. She didn't—instead, she hit me head-on!

I flew over the handlebars and into her windshield. The back of my head bounced off her steering wheel, and then I was thrown face-first into a telephone pole on the side of the road. The doctor said that if I hadn't been wearing a full-face helmet, parts of my head would have been smashed into the windshield and the left side of my face would have been left on the pole.

I was in and out of consciousness for the first 4 days after the accident. I woke up long enough to say that I wasn't unconscious the whole time, but I was in a semi-unconscious state for the next 2 weeks. By the time I realized what was going on, a month had passed. Although my parents had come to see me, I didn't even know they were there. Some of my co-workers were there every day to help my wife, who basically lived in my hospital room with me—but I didn't remember that either.

I spent more than 2 months in the hospital receiving physical and occupational therapy. I had suffered a double brain concussion, and my brain swelled so badly the doctors thought they would have to drill holes in my skull to relieve the pressure. Fortunately, they didn't have to do that because the swelling went down.

I lost most of my memory and even had to learn how to walk again. One day, the doctor gave me a razor and told me to shave, but it wasn't until after I was released from the hospital that I found out the razor didn't have a blade in it. The doctors just wanted to see how good my coordination was—they didn't trust me with a blade.

I also had a problem with my memory; I knew names and people, but that was about it. Part of my therapy was going back out to the airfield to learn stuff that I once knew. It was only after I was told what an item was that it rang a bell and came back to me. I'd say, "Oh yeah, that's what that is, now tell me again what it does." Once they would do that I'd say, "Oh yeah that's right, I remember now!"

After a little more than 2 months passed, the doctor gave me a quick test. He told me to remember three things: the number 7, ice cream, and blue sky. After he talked to me for what seemed like an hour, he asked what the three things were. Once I told him, he said I was ready to go home.

The things listed on my profile that I couldn't do made me feel like there was little that I *could* do! No driving for a year, no climbing on top of aircraft, no going inside an aircraft unless the ramp was down and I could walk up it. I couldn't stand for more than 10 minutes, walk more than a mile, run, do physical training, and—for the fear of black-outs—go anywhere alone. My flying and crewing days were over for the next couple of years.

It took years of hard work before I got back to normal—well, about as normal as I will ever be. I still have some minor problems with my memory, but I did make it back on flying status after several years. For me, life is good. I am living a life that would have ended if I hadn't been wearing my helmet the night that girl turned in front of me.

You hear people argue that wearing a helmet gets in the way of their "personal freedom" or keeps them from hearing or seeing dangers around them. Well, I can tell you from experience that helmets work because I AM STILL HERE. ♦

—MSG Shane Curtis is an Aviation Systems Safety Manager for the CH-47 at the U.S. Army Safety Center. The Curtis' have been married for 26 years and have a 17-year-old daughter.

Operations Fax Number Changes

If you wish to fax your aviation accident report (DA 7305-R) or ground accident report (DA 7306-R) to the Safety Center, the Operations Office has recently changed their fax number. It is now DSN 558-3749 (334-255-3749) instead of x3743. ♦

—Cissy Presnell, Operations Office, DSN 558-3410 (334-255-3410); manuela.presnell@safetycenter.army.mil

Correction

In the March 2003 *Flightfax* accident briefs, the AH-64D Class B brief should have read—*"While the aircraft was in phase maintenance, the mast-mounted "radar" was dropped approximately 12 feet during hoist operations."* We regret this error. ♦

SAFETY MESSAGES

RECAP OF SELECTED 1ST & 2ND QTR FY03 SAFETY MESSAGES

*The following is a listing of selected aviation safety action messages (ASAMs) and safety-of-flight (SOF) messages issued by Aviation Missile Command (AMCOM) from 1 Oct 02 through 31 Mar 03. Complete copies are available on the AMCOM web page at **https://ams14.redstone.army.mil/safety/sof.***

AH-64

■ **AH-64-03-ASAM-01**, 141300Z Nov 02, maintenance mandatory, RCS CSGLD-1860(R1), all AH-64 series aircraft, main landing gear upper shock strut. POC: Joseph Creekmore, DSN 788-8630.

■ **AH-64-03-ASAM-02**, 201405Z Nov 02, maintenance mandatory, RCS CSGLD-1860(R1), all AH-64D aircraft, main rotor driveshaft retirement life. POC: Joseph Creekmore, DSN 788-8630.

■ **AH-64-03-ASAM-03**, 241500Z Feb 03, informational, RCS CSGLD-1860(R1), AH-64D, cockpit canopy fogging. POC: Howard Chilton, DSN 897-2068.

■ **AH-64-03-ASAM-04**, 241550Z Feb 03, maintenance mandatory, RCS CSGLD-1860(R1), all AH-64 series aircraft, wing-mounting nuts/bolts. POC: Howard Chilton, DSN 897-2068.

■ **AH-64-03-ASAM-05**, 241600Z Feb 03, maintenance mandatory, RCS CSGLD-1860(R1), all AH-64 series aircraft, pylon attachment bolts. POC: Howard Chilton, DSN 897-2068.

■ **AH-64-03-SOF-01**, 201355Z Nov 02, technical, RCS CSGLD-1860(R1), all AH-64A aircraft, main rotor driveshaft retirement life. POC: Joseph Creekmore, DSN 788-8630.

■ **AH-64-03-SOF-02**, 271800Z Jan 03, technical, RCS CSGLD-1860(R1), all AH-64 series aircraft, main transmission replacement time. POC: Howard Chilton, DSN 897-2068.

■ **AH-64-03-SOF-03**, 241520Z Feb 03, technical, RCS CSGLD-1860(R1), all AH-64D aircraft, cyclic stick. POC: Howard Chilton, DSN 897-2068.

CH-47

■ **CH-47-03-ASAM-01**, 251331Z Mar 03, maintenance mandatory, RCS CSGLD-1860(R1), all H-47 aircraft, engine drive shaft. POC: Russ Peusch, DSN 788-8632.

■ **CH-47-03-SOF-01**, 042115Z Oct 02, technical, RCS CSGLD-1860(R1), all H-47 Chinook aircraft, swashplate bearing, fwd and aft. POC: Joseph Creekmore, DSN 788-8630.

OH-6

■ **OH-6-03-ASAM-01**, 121445Z Nov 02, maintenance mandatory, RCS CSGLD-1860(R1), all OH-58D, H-6J, and H-6M aircraft, fuel filter bracket. POC: Ron Price, DSN 788-8636.

OH-58

■ **OH-58-03-ASAM-02**, 051502Z Dec 02, maintenance mandatory, RCS CSGLD-1860(R1), OH-58D aircraft, installation of throttle mark. POC: Ron Price, DSN 788-8636.

■ **OH-58-03-ASAM-03**, 211405Z Jan 03, maintenance mandatory, RCS CSGLD-1860(R1), OH-58D aircraft, engine barrier filter screw retaining ring. POC: Ron Price, DSN 788-8636.

■ **OH-58-03-ASAM-04**, 252220Z Mar 03, maintenance mandatory, RCS CSGLD-1860(R1), OH-58D aircraft, performance charts. POC: Ron Price, DSN 788-8636.

■ **OH-58-03-SOF-01**, 031200Z Oct 02, technical, RCS CSGLD-1860(R1), all OH-58D aircraft, copilot cyclic lockout. POC: Ron Price, DSN 788-8636.

■ **OH-58-03-SOF-02**, 182125Z Mar 03, operational, RCS CSGLD-1860(R1), all OH-58D aircraft, hellfire missile. POC: Ron Price, DSN 788-8636.

UH-1

■ **UH-1-03-ASAM-01**, 231345Z Oct 02, maintenance mandatory, RCS CSGLD-1860(R1), all UH-1H/V series aircraft, main rotor grip retirement life/inspection. POC: Ron Price, DSN 788-8636.

UH-60

■ **UH-60-03-ASAM-01**, 091330Z Dec 02, maintenance mandatory, RCS CSGLD-1860(R1), all H-60 series aircraft, bellcrank support assembly retirement life. POC: Ron Price, DSN 788-8636.

■ **UH-60-03-ASAM-02**, 091335Z Dec 02, maintenance mandatory, RCS CSGLD-1860(R1), all H-60 series aircraft, tail rotor servo retirement life. POC: Ron Price, DSN 788-8636.

■ **UH-60-03-SOF-01**, 201415Z Nov 02, technical, RCS CSGLD-1860(R1), all UH-60A, EH-60A, and UH-60Q series aircraft, main module planetary carrier assembly. POC: Ron Price, DSN 788-8636.

■ **UH-60-03-SOF-02**, 071705Z Jan 03, technical, RCS CSGLD-1860(R1), all H-60 series aircraft, inspection of main rotor blade cuff assembly. POC: Ron Price, DSN 788-8636.

■ **UH-60-03-SOF-03**, 151600Z Feb 03, technical, RCS CSGLD-1860(R1), all UH-60A, EH-60A, and UH-60Q series aircraft, main module planetary carrier assembly retirement life. POC: Ron Price, DSN 788-8636.

All Army Aircraft

■ **GEN-03-ASAM-01**, 161700Z Dec 02, maintenance mandatory, RCS CSGLD-1860(R1), all Army aircraft, single channel ground and airborne radio (SINCGARS) ARC-201 battery box. POC: Russell Peusch, DSN 788-8632.

■ **GEN-03-ASAM-02**, 131313Z Mar 03, informational, RCS CSGLD-1860(R1), all Army aircraft, M18/M19 landing mat set operations. POC: Harry Trumbull, DSN 897-2095. ♦

Point of contact for SOF/ASAM message distribution, compliance reporting, and administrative matters is the AMCOM Safety Office. Technical or logistical questions should be addressed to the points of contact indicated in the messages. AMCOM Safety Office representatives can be reached at: (256) 842-8620 or 313-2097 (DSN 788); E-mail: safeadm@redstone.army.mil.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class A**: While in cruise flight at approximately 100 knots, 100 feet above ground level (AGL) in a six-aircraft staggered right formation, the pilot-in-command (PC) of Gun Two announced to the flight that he heard a strange noise in the aircraft and was going to land. Guns One and Four informed Gun Two that smoke was coming from their aircraft and that the aircraft was on fire. As a result, the PC of Gun Two landed the aircraft. The crew executed an emergency engine shutdown and performed the auxiliary power unit (APU) fire emergency procedure, employing at least one of the fire bottles into the APU compartment. Both crewmembers egressed the aircraft uninjured. The aircraft was destroyed by the fire.

CH-47

D Model

■ **Class A**: Aircraft experienced a hard landing following failure of the #1 engine

■ **Class C**: While conducting hilltop operations, the front rotor blades struck a tree, damaging three blades.

■ **Class C**: While attempting a sling load pick up of a flatbed, the aircraft encountered a wind gust that caused the aft portion of the aircraft to make contact with the aft portion of the flatbed. Damage to the aircraft consisted of buckled main (former) supports, three to four sheets of punctured metal, and three rivots ripped out along station 460.

OH-58

D Model

■ **Class D**: While hovering in a confined area, a noise was heard with no other indications. The PC landed at an airfield that was less than a quarter-mile away. Post-flight inspection revealed damage to the tail rotor blades.

DR Model

■ **Class B**: Aircraft crashed. Details of the accident were not provided.

■ **Class B**: Aircraft crashed during manual throttle operations. No other details were provided.

■ **Class C**: Aircraft reportedly experienced a full authority digital electronic control (FADEC) failure warning with audio while at a 3-foot hover from refuel to parking. The engine oversped to 124 percent engine power turbine speed (N_p) for 6 seconds during throttle reduction and activation of the FADEC AUTO/MAN switch. The aircraft was shut down without further incident after a cool-down period.

■ **Class C**: Aircraft crashed. Details of the accident were not provided.

■ **Class C**: Aircraft experienced inadvertent engine and rotor overspeed during engine run-up.

EH-60

A Model

■ **Class D**: As the main wheels broke ground during takeoff to a hover for the first flight of the day, the crew heard a loud noise and the aircraft lurched several feet. The crew then landed the aircraft without further incident. Subsequent inspection revealed that the tail strut and tail tire had blown. Failure of the tail strut caused minor damage to the tailboom.

UH-60

A Model

■ **Class B**: Aircraft crashed. Details of the accident were not provided.

■ **Class C**: During approach, crew experienced brownout conditions. Aircraft tail wheel made hard contact with the ground, damaging three main rotor blade caps and the tail rotor drive shaft cover.

■ **Class C**: Aircraft tail rotor blades contacted trees while aircraft was operating in a confined area landing zone.

■ **Class D**: While conducting FM Homing Operations inbound to airfield, the pilot and instructor pilot noticed an electrical odor in the cockpit. They completed the emergency procedure for electrical fire in flight and landed at the airfield without further incident. Maintenance determined that an improper clamp installation had been performed during a previous HUD modification to the aircraft. A short occurred, destroying the FM radio.

L Model

■ **Class A**: Aircraft crashed. Details of the accident were not provided.

■ **Class A**: Accident aircraft was Chalk 4 in a flight of six for assault training when its main rotor system was reportedly contacted in flight by the right main landing wheel of Chalk 5. Chalk 4 crash-landed, sustaining extensive damage; Chalk 5 landed without further incident.

AN-2/COLT

■ **Class C**: Aircraft nose contacted the ground during takeoff, damaging the propeller system and wings.

Note: For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410). Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. There have been numerous accidents in Kuwait and Iraq since the beginning of Operation Enduring Freedom. We will publish those details in a future *Flightfax* article.

WRONG ASSUMPTION!

A military C-5 was stopped by the efforts of two airline employees. The two employees frantically chased after the C-5 upon noticing it had run over a 100-pound fire extinguisher. The extinguisher was lodged in between the nose gear and sparking as it rolled forward. The crew never realized they had run over the fire extinguisher, but did wonder why there were two crazed women chasing their C-5.

Ensure all ramps are free and clear and wing-walkers are in place prior to taxiing.

Submitted by: CW3 Ron Kammeyer, Airfield Safety Officer (Johnson Controls Inc.), Bicycle Lake Army Airfield, Fort Irwin, CA, (760) 380-3902/4326, ronald.kammeyer@irwin.army.mil